

Notes on the flora of the Lake Superior region. II.

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The early part of my time at the north was favorable for work among the Carices, as they continued to be in a good condition for study there till the middle of August. There are some which we expect to find as restricted to the northern regions, or, if more widely spread, are more common there. Among those found in the neighborhood of Champion may be mentioned *C. tenuiflora* Wahl., in low places in cold woods; *C. trisperma* Dewey, abundant, and usually in company with the equally abundant *C. polytrichoides* Muhl., everywhere in springy ground and along the rills; *C. Deweyana* Schwein., in dry ground among bushes, but not abundant; *C. Magellanica* Lam., in bunches in peat bogs, generally in the shade of tamaracks, and, though slender, striking on account of its purple scales; *C. arctata* Boott, quite like its more widely spread congener, *C. debilis* Michx., var. *Rudgei* Bailey, but with stiffer stem and much broader and shorter leaves, both growing in tufts in rather cold woods; *C. varia* Muhl., in dry woods. Of these the last two and *C. polytrichoides* are also found at the head of Lake Michigan. *C. monile* Tuckerm. is seen everywhere in the watery ground, its roots usually submerged and often provided with very long stolons. It is exceedingly variable in some of its characteristics, and puzzling to make out. The variations affect size of spike, width of leaves, and size in general, and sometimes the fruit. The spikes are sometimes long and rather thick, or they may be short, or narrow and interrupted, or very loosely flowered, much as in var. *monstrosa* Bailey. One of the most puzzling was found in a swamp at Humboldt, having a short and thick perigynium and the beak almost entire, but evidently *C. monile*. In the same swamp was found *C. oligosperma* Michx. It has a tall, stiff, few-leaved stem, the spikes small and aggregated near the top, reminding one of a *Scirpus* or *Eriophorum*. By the wet margin of Michigamme lake some abnormal specimens of *C. retrorsa* Schwein. were seen, with a single sterile spike and small fertile ones, bearing some resemblance to *C. lurida* Wahl. *C. flava* L. seems at the north to take the place of *C.*

flava var. *viridula* Bailey, that is common further south, and very abundant in wet sands near Chicago. Collections at the foot of Lake Michigan at Petoskey and Escanaba are of the type, those about Chicago of the variety. Nor is it reported from this vicinity by others. Some from Calumet were of a mixed character, though referable to the type. They sustained the reduction of the former *C. Cæderi* to a variety, for otherwise it would not have been easy to place these with satisfaction.

Of other sedges notice may be taken of *Scirpus polyphyllus* Vahl., which we do not find here. It is quite far north for the species, and may be looked upon as rare. It was found at Champion. *Eriophorum cyperinum* L. of the typical form, its spikes clustered in heads, grew in the same locality. I do not find it so often as the forms with drooping rays, which are the common ones.

Some of the grasses gathered in the neighborhood of Champion deserve mention. *Poa debilis* Torr. grew in tufts in dry open woods, its stems very slender as the name indicates, but the flowers acute rather than obtuse as they are described to be. *Danthonia spicata* Beauv. was common in the sterile soil along the "Granite Range;" and in wettish ground a diminished form of *Bromus ciliatus*, but fifteen inches to two feet high. *Cinna pendula* Trin. was seen in the borders of damp woods; and in the damp upland woods *Millium effusum* L. Specimens of *Avena* were found in the cold woods that do not accord well with either of the two species of our northern borders, a smooth slender plant from a foot and a half to nearly three feet high, the radical leaves from 6-12 inches long and but a line or two wide. The glumes have more nerves than those of *A. striata* or *A. Smithii*, varying from three in the outer to thirteen in the flowering.

Ten days of my time were spent at Marquette. This is the port from which most of the iron of the region is shipped, for which it affords excellent facilities in its long docks down to which the cars descend from the surrounding hills. It is the finest town in the Northern Peninsula, and a pleasant place in which to pass the summer months. Bold, rocky hills are close by on the south and east, the ledges of which come close to the shore of the lake, and from whose tops may be obtained extensive views of the surrounding country, the low Huron mountains being in sight to the north and west. Here the rocks of the Iron Group and of the Lauren-

tian are skirted along the shore by the sandstones of Lake Superior, and there are sandy reaches with a corresponding modification of the flora of the lakes with much the same facies as seen in analogous cases by Lake Michigan, except its more northerly coast. Close to the city on the north is a tract of Red Pine. The groves of this pine, with their park-like appearance, are always attractive, though too clean to furnish much variety to the collector of plants. All is open beneath the straight, trim trunks, and there is a stillness almost to loneliness except for the sighing of the winds among the leaves, which tends to intensify the feeling. Without bushes to obstruct the view, or impede progress, one can ride or drive almost anywhere except for a fallen tree here and there. The ground is matted with a floor of dry needles, elastic, clean, and free from dampness, and one can sit or lie down without danger of cold. But the variety that is lacking in the grove may be found in the lower or swampy ground between it and the shore, where ridges of sand alternate with reedy or grassy sloughs, then come the beach and its outlying rocks. Here is a sand barren such as are seen in many places by the shores of the great lakes. Through this runs a good road for two or three miles, going north by the shore to Presque Isle, a part of the city as well as the road, and used for a park and pleasure drive. Few cities can offer a finer one for beauty of situation, or for the views of the lake that may be obtained from it. Presque Isle is a promontory jutting out into the lake, rising to the height of one hundred and fifty feet, and ending precipitously in cliffs of sandstone and eruptive or conglomerate rock. The upward slope is gentle, and the road makes the circuit of it, near the shore where the sandstone predominates, but forced back on the northeast side by ravines and ridges. It is thickly overgrown with timber in its native wildness, hard woods interspersed with pines and hemlock. The point is properly named, for it is nearly surrounded by the waters of Lake Superior and by swamps bordering the lake and Dead river, crossed just before reaching it. Narrow ridges of sand, but little above the level of the swamps, connect its base with the hills to the westward. It is a favorite place to which citizens and visitors resort for driving and for pleasure, but I chose to make my trips on foot, as detours were possible along the road by foot-paths leading into the adjoining woods. Many of the plants were of kinds previously seen, but there were enough strange ones to give zest to the work.

Three of the Fumitory family grew on Presque Isle, *Corydalis glauca*, *C. aurea* and *Adlumia cirrhosa*. *C. glauca* was common on the rocks at Champion, and *C. aurea* had been gathered near Carp river, south of Marquette, but all flourished here side by side. *Corydalis* takes to gravelly soil as well as rocks, not so often with *C. glauca* as with *C. aurea*, as it is unusual for the former to be found away from the nearly bare rocks, where they grow in a thin covering of soil. And it was damp enough for the *Adlumia*, which grew in plenty on the steep banks of the shore, as well as in the edges of the woods with the others. All being in bloom and of vigorous growth, the smooth glaucous plants covered with purple and yellow flowers, afforded a handsome sight. There was the same peculiarity in the flowers of *C. aurea* as in those found at Quinnesee in 1883, the prominent crest denticulate and the other petals dentate-ciliate. This is not mentioned in our books, for it is regarded as a mark of a group including *C. flavula* and its allies. *Adlumia cirrhosa* seemed somewhat out of place so far north, and may have been introduced, though there were no evidences of it from the surroundings. The plants were very vigorous, the stems several feet long, especially on a slope where the timber had been burnt and the ground scorched by the fire, a kind of soil in which the plant appears to delight. But the latitude may not be against its nativity here, since it is reported by Macoun at Rivière du Loup, on the lower St. Lawrence, a latitude more northerly than Marquette. He mentions other stations nearly as far north, one of them Gore Bay, on the north side of Grand Manitoulin Island, Georgian Bay.

The rocks on the extreme north-east part of Presque Isle are eruptive in character, a dark, almost black magnesian serpentine, weathering with a very rough surface. They spread out flat and nearly bare over a space of several acres, and in places where they join the conglomerate are pervaded by a network of sparry veins filled with various minerals of a lighter color, which gives them a unique appearance when seen dipping under the clear water of the lake here entirely devoid of sand. Being worn smooth by the waters they show a tessellated structure, and the lighter colored lines dividing the blocks often seem to undulate and gyrate in the sunlight simulating the motion of the wavelets.

In the cup-like cavities of the surface of these rough rocks, where some earth had lodged or a soil been formed, a few plants were seen, mostly grasses and *Solidagos*. The

usual *Solidago* was *S. juncea* Ait., common in the cavities and crevices of all the cliffs by the shores about Marquette. They are from one to two feet high, and generally have very narrow leaves, all entire or nearly so. But the most interesting growth in these tiny hollows, sometimes but an inch in diameter and completely filled with the roots of the plants, were the tufts of a small grass, six to eight inches high, *Trisetum subspicatum* Beauv., var. *molle* Gray. It was not abundant, but in a good condition for collecting the last of July.

Three other small plants, which I had not seen before, were found on these rocks. They grew together in a larger hollow filled with water evidently from the rains or from the spray of the waves when they ran high. Nourished by this little pool, by the borders of which some soil had gathered, or clinging to the damp rock, they occupied but a foot or two of space. Rooted in the soil were *Scirpus cæspitosus* and *Primula Mistassinica*, and, on the face of the rock by the edge of the water, *Pinguicula vulgaris*. It was too late in the season for the flowers of the last two, and I had to be contented with the plants in fruit. None of these are common plants, though widely spread throughout our northern borders and beyond, the *Scirpus* extending further south and with a wider range. It is a mountain or sub-alpine plant, mainly found on the mountains in the eastern states, but coming more into the swamps in the region of the lakes. It is represented in the flora of Roan Mountain, N. C., and at the west in the Rockies. The plants are very slender, and the fruit in those found was mostly aborted.

The two native *Primulas* of our flora are also northern plants, keeping well to the basin of the St. Lawrence and northward when away from the coast region. *P. farinosa* I have seen but once, at Petoskey, where it grows in sandy soil. Both are plants of wide distribution, being found in Europe. *P. farinosa* is also found in Asia, and in Antarctic America by the Straits of Magellan and on the Falkland Islands—the *P. Magellanica* of Lehman, but joined to *P. farinosa* by De Candolle. At the north it goes around the world, and is one of the few terrestrial plants represented in the cold regions of the northern and southern hemispheres without any known intertropical stations. Both plants are very small, and it is generally the small plants that make these wide migrations. The *Scirpus* is likewise a plant of Europe, and the *Pinguicula* of Europe and northern Asia. This

seems to have been collected by Dr. Douglas Houghton on Presque Isle, when he accompanied Schoolcraft to the source of the Mississippi in 1832, since he mentions it in the list of plants appended to the narrative of the expedition. But he seems to have been in doubt as to its specific character, the notice of the plant reading, "Pinguicula (n. spec.) Presque Isle, Lake Superior." My specimens seem in no way peculiar, the only characteristic not anywhere mentioned being the deeply violet or almost purple tinge of many of the leaves. Hence I take this to be the plant, since the two other northern species of *Pinguicula*, *P. alpina* and *P. villosa* are not known to occur in our district. In an explanatory note prefixed to the list he intimates that a more detailed account of the plants would be published at some future day, but I am not aware that this was ever done.

Some plants of interest were found by the beach. The Evening Primrose was the common *Oenothera biennis*, but it approaches *O. Oakesiana* Robbins. Its flowers are smallish, leaves narrowly lanceolate, the pubescence mostly short and soft, the stem becoming nearly or quite smooth at the base. The same was observed along the shore on Keweenaw Peninsula. *Ammophila arundinacea* Host. grew in plenty in a ridge of sand between Dead river and Presque Isle. It was a narrow ridge between the carriage road and lake, and the utility of the plant was well shown by its power to hold the loose sands in place against both wind and waves. For this purpose it has been planted on the Atlantic coast, as at Provincetown, Mass., whose harbor, as well as the town, are said to owe their preservation to this plant. A special law in England and Scotland protects it from destruction for a like purpose¹. It goes vertically down for some distance into the sand, and is copiously furnished with running rootstocks, which, with the broom-like habit of growth of its stiff culm and leaves, well adapt it to catch and hold the shifting sands. It is found by the shores of Lake Michigan, as at Whiting, Ind., but is not as common as *Calamagrostis longifolia*, that serves a similar purpose. Another grass of the beach was *Agropyrum repens* Beauv., appearing harmless enough here as compared with the grass so troublesome to the farmer under the name of Couch, or Quick-grass. Although the sands are light and offer no impediments to its spreading, it does not generally possess the long and running stolons that characterize it in the cultivated fields, and make it so difficult to

¹Abbe Provancher, Flore Canadienne, p. 684. Vasey, Agric. Grasses, p. 70.

contend with. This may be due to the poorer soil, and a plant harmless in its native place becomes a noxious weed when supplied with abundant food in the farm and garden. From the conditions of growth, accompanied by *Panicum virgatum* and the willows and cornel bushes characteristic of the shore, and cut off by a wide extent of swampy land and woods from any cultivated fields where it might be growing, I consider it indigenous here. It was found once before under analogous conditions of growth upon sand hills in the woods and barrens east of Petoskey, and at a distance from farms, and the conclusion was plain that it was a native grass. It was accompanied by *A. dasystachyum* Vasey, regarded as indigenous along the great lakes. The evidence of nativity in both is equally good, and the conditions of growth can not be disconnected so as to give a different origin to the two. The plants found at Marquette were mostly taller than those in cultivated ground, and grew somewhat isolated, generally not more than a single stalk from the same root.

Another native grass, *Festuca ovina*, was collected in this vicinity. It was found on a mass of rock, called Picnic Island, much frequented by the children of the city for their pastimes. It is an island only when the waves are high, being joined to the mainland by a low sand-spit ending in this rock, and accessible on foot at ordinary times. Several kinds of plants grew here, where the crevices and cavities protected them from the trappings of the busy feet, among them the most interesting being the *Festuca* and the *Trisetum* mentioned above. It is a low plant from six to twelve inches high, and is known to be native about Lake Superior and other parts of the north, and naturalized in pastures further south. I have seen it but once in the vicinity of Chicago, on the banks of the Calumet, in the woods about a mile east of Hammond, Ind. It may be a native here, since several other northern plants are present at the head of Lake Michigan, and I do not know that it grows elsewhere in our fields, either from my own or the observations of others. It is confined to a small area in the edge of the woods.

On another spur of rock, Light-house Point, jutting out into the lake, and forming the harbor of Marquette on the north, grew the Dwarf Service-berry, *Amelanchier alnifolia* Nutt. It was a small shrub but a foot or two high, and presented a handsome appearance with its abundance of purple fruit, as it clung to the rocks, rooting in the crevices or where it could find a foothold. It might be utilized as a plant for rock-work.

In the swamp to the north of the city, *Juncus stygius* L. was seen in a few places. It is a very slender rush, and rather rare, occurring sparingly on our northern borders and the neighboring parts of Canada.

A form of *Solidago humilis*, from 12-18 inches high, was collected in the sandy land near the mouth of Carp River. The floral portion of the stem is quite pubescent, and the part below slightly so, but the plant is smooth at the base. The leaves are sharply serrate, or somewhat toothed, approaching the variety *Gilmani*, but hardly marked enough to be separated from the type.

Among vascular cryptogams, or pteridophytes, one sees in plenty the five common species of club moss, and once in the wet sands north of Marquette the rarer *Lycopodium inundatum* was detected. It is also found in our own vicinity at Tolleston and Millers, growing in similar places, though I have not seen it elsewhere in collecting about the lakes, although it has a few other stations assigned it. East of Marquette on the ridges of the rocky wooded hills sloping toward the lake, grew in abundance *Equisetum scirpoides*, the smallest of the horsetails, and not very common, though it ranges throughout the region of the lakes. I have met with it but once before, at Northport, Grand Traverse Bay, where it sometimes took as a habitat stumps and logs on which sand had lodged. A noticeably small form of *Botrychium Virginicum*, from 7-9 inches high, was found beside Teal Lake, Negaunee, and in the Keweenaw Peninsula, like that described as *B. gracile* Pursh. Wherever seen the species seemed more slender than the common form farther south.

Englewood, Ill.

A new *Ramularia* on cotton.

GEO. F. ATKINSON.

During the autumn of 1889 I collected from several different plantations in the vicinity of Auburn, Alabama, leaves of cotton infested by a fungus which proves to be an undescribed species of *Ramularia*. In view of the importance of cotton culture and the fact that some species of *Ramularia* are known to be quite destructive to a few cultivated plants it may not be out of place to record the discovery and characterize the fungus.